

MAQTQGTRRKVCYYDGDVGNYYYGQGHPMKPHRIRMTHNLLLN  
YGLYRKMEIYRPHKANAEEMTKYHSDDYIKFLRSIRPDNMSEYSKQMQRFNVGEDCPV  
FDGLFEFCQLSTGGSVASAVKLNKQQTDIAVNWAGGLHHAKKSEASGFCYVNDIVLAI  
LELLKYHQRVLYIDIDIHHGDGVEEAFYTTDRVMTVSFHKYGEYFPGTGLRDI GAGK  
GKYAVYPLRDGIDDES YEAI FKPVMSKVMEMFQPSAVVLQCGSDSLSGDRLGCFNL  
TIKGHAKCVEFVKSFNLPMLMLGGGYTIRNVARCWTYETAVALDTEIPNELPYNDYF  
EYFGPDFKLHISPSNMTNQNTNEYLEKIKQRLFENLRMLPHAPGVQMQAIPEDAIP EE  
SGDEDEDDPKRISICSSDKRIACEEEFSDSEEEGEGGRKNSSNFKKAKRVKTEDEKE  
KDPEEKKEVTEEEKTKEEKPEAKGVKEEVKLA (SEQ ID NO:1)

FIG. 1A

1 atgtctgggg tctctgcccg ctggtgctgc tgtctccac tcggtcatcc tgagaacaca  
 61 gcctgagcgr ctctgtcact cggggtagac cagcgggga ggcgagcaag atggcgaga  
 121 cgcagggcac ccgaggaaa gtctgttact actacgacgg gaatgttga aattactatt  
 181 atggacaagg ccaccaatg aagcctcac gaatccgcat gactcataat ttgctgctca  
 241 actatggtct ctaccgaaa atggaatct atgccctca caagccaat gctgaggaga  
 301 tgaccaagta ccacagcgt gactacatta aattcttgcg ctccatccgt ccagataaca  
 361 tgtcggagta cagcaagcag atgcagagat tcaacgttgg tgaggactgt cagtatctg  
 421 atggcctgtt tgagtctgt cagttgtcta ctggtggtc tgtggcaagt gctgtgaaaac  
 481 ttaataagca gcagacggac atgcctgtga atgggctgg ggccctgcac catgcaaaaga  
 541 agtccgagc atctggcttc tgttacgtca atgatatcgt cttggccatc ctggaactgc  
 601 taaagtatca ccagaggtg ctgtacatg acattgatat tcaccatggt gacggcgtgg  
 661 aagaggcctt ctacaccag gaccgggtca tgactgtgtc ctttcataag tatggagagt  
 721 acttcccagg aactggggac ctacgggata cggggctgg caaagacaag tattatgctg  
 781 ttaactacc gctccgagac gggattgatg acgagtccta tgaggccatt ttcaagccgg  
 841 tcatgtccaa agtaatggag atgttccagc ctagtgcgtt ggtcttacag tgtggctcag  
 901 actccctatc tggggatcgg ttaggttgct tcaatctatc tatcaaaagg cagccaagt  
 961 gtgtggaatt tgtcaagagc tttaacctgc ctatgctgat gctgggaggc ggtggttaca  
 1021 ccattcgtaa cgttgcccgg tgctggacat atgagacagc tgtggccctg gatacggaga  
 1081 tccctaataga gcttccatc aatgactact ttgaatactt tggaccagat ttcaagctcc  
 1141 acatcagtc cccaatatg actaaccaga acacgaatga gtacctggag aagatcaaac  
 1201 agcgactgtt tgagaacctt agaatgctgc cgcacgcacc tgggggtccaa acgcaggcga  
 1261 ttcctgagga cgcatccct gaggagagtg gcgatgagga cgaagacgac cctgacaagc  
 1321 gcatctcgat ctgctcctct gacaaacgaa ttgccttgtga ggaagagtcc tccgattctg  
 1381 aagaggaggg agaggggggc cgcaagaact ctccaactt caaaaaagcc aagagagtca  
 1441 aaacagagga tgaaaaagag aaagacccag aggagaagaa aggaatcaccc gaagaggaga  
 1501 aaaccaagga ggagaagcca gaagccaaag ggttcaagga ggaggccaag ttggcctgaa  
 1561 tggaccctct cagctctggc ttcctgtgta gtccctcacg tttctttccc c (SEQ ID NO:2)

FIG. 1B

MAYSQGGGKKCKVCYYYDGDIGNYYYQGQHPMKPHRIRMTHNLLL  
NYGLYRKMEIYRPHKATAEEMTKYHSDEYIKFLRSIRPDNMSEYSKQMHIPFNVGEDCP  
AFDGLFEFCQLSTGGSVAGAVKLNRRQQTDMAVNWAGGLHHAKKYEASGFCYVNDIVLA  
ILELLKYHQRVLYIDIDIHHRGDGVEEAFYTTRVMTVSFYGEYFPGTGLRDIGAG  
KGKYYAVNFPMDGIDDESYGQIFKPIISKVMEYQPSAVVLQCGADSLSGDRLGCFN  
LTVKGHAKCVEVVKTFNLP LLMLGGGYTILRNVARCWTYETAVALDCEIPNELPYNDY  
FEYFGPDFKLHISPSNMTNQNTPEYMEKIKQRLFENLRMLPHAPGVQMQAIPEDAVHE  
DSGDEGEDPDKRISIRASDKRIACDEEFSDSEDEGGGRNVADHKKGAKARIEED  
KKETEDKKTVDKEEDKSKDNSGEKTDTKGKSEQLSNP (SEQ ID NO:3)

FIG. 2A

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1  cgccgagctt  tggcacctc  tggcgggtgg  taccgagcct  tccggcgcc  ccctcctctc
61  ctcccacgg  cctgccctc  ccgcgggac  tatcgcccc  acgtttccct  cagccctttt
121 ctctccggc  cgagcgcgg  cgccagcagc  agcagcagca  gcagcaggag  gaggagcccg
181 gtggcggcg  tggcgggga  gccatggcg  tacagtcaag  gagggggcaa  aaaaaaagtc
241 tgctactact  acgacggtga  tatttgaat  ttttattatg  gacaggggtca  tcccatgaag
301 cctcatagaa  tccgcatgac  ccataacttg  ctgttaaatt  atggcttaca  cagaaaaatg
361 gaaatatata  ggcccataa  agccactgcc  gaagaaatga  caaaatatca  cagtgatgag
421 tatatcaaat  ttctacggtc  aataagacca  gataacatgt  ctgagtatag  taagcagatg
481 catatatata  atgttggaga  agattgtcca  gcgtttgatg  gactctttga  gttttgtcag
541 ctctcaactg  gcggttcagt  tgctggagct  gtgaagttaa  accgacaaca  gactgatatg
601 gctgttaatt  gggctggagg  attacatcat  gctaagaaat  acgaagcatc  aggatcctgt
661 tacgttaatg  atatgtgct  tgccatcctt  gaattactaa  agtatcatca  gagagtctta
721 tatatcgata  tagatatcca  tcatgggtgat  ggtgtcgaag  aagcttttta  tacaacagat
781 cgtgtaatga  cggtatcatt  ccataaatat  ggggaatact  ttctggcac  aggagacttg
841 agggatatatg  gtgctggaaa  aggcaaatat  tatgctgtca  atttccaat  gtgtgatggt
901 atagacgatg  agtcatatgg  gcagatatat  aagcctatta  tctcaaaggt  gatggagatg
961 tatcaaccta  gtgctgtggt  attacagtgt  ggtgcagact  cattatcttg  tgatagactg
1021 ggttgtttca  atctaacagt  caaagggtcat  gctaaatgtg  tagaagtgtt  aaaaactttt
1081 aacttaccat  tactgatgct  tggaggagggt  ggctacacaa  tccgtaatgt  tgctcgatgt
1141 tggacatatg  agactgcagt  tgcccttgat  tgtgagattc  ccaacgagtt  gccatataat
1201 gattactttg  agtattttgg  accagacttc  aaactgcata  ttagtccttc  aaacatgaca
1261 aaccagaaca  ctccagaata  tacggaaaag  ataaaacagc  gtttgtttga  aaatttgcgc
1321 atgttacctc  atgcacctgg  tgccagatg  caagctattc  cagaagatgc  tgttcatgaa
1381 gacagtggag  atgaagatgg  agaagatcca  gacaagagaa  ttcttatctg  agcatcagac
1441 agcggatag  cttgtgatga  agaattctca  gattctgagg  atgaaggaga  aggaggtcga
1501 agaaatgtgg  ctgatcataa  gaaaggagca  aagaaagcta  gaattgaaga  agataagaaa
1561 gaaacagagg  acaaaaaaac  agacgttaag  gaagaagata  aatccaaagg  caacagtgggt
1621 gaaaaaacag  ataccaaagg  aaccaaatca  gaaacagctca  gcaacccctg  aatctgacag
1681 tctcaccaat  ttcagaaaat  catlaaaaag  aaaatatgga  aaggaaaaatg  tttctttttt
1741 gaagacttct  ggcttcattt  tatactactt  tggcatggac  tgtattttat  ttcaaatggg
1801 actttttcgt  ttttgttttt  ctgggcaagt  tttattgtga  gatcttctaa  ttatgaagca
1861 aaattttctt  tctccacctt  gctttatgtg  atagtattta  aaattgatgt  gagttattat
1921 gtcaaaaaaa  ctgatctatt  aagaagtaa  ttggcctttc  tgagctgaaa  aaaaaaaaaa
1981 aaaag (SEQ ID NO:4)

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FIG. 2B

MAKTVAYFYDPDVGNFHYGAGHPMKPHRLALTHSLVLHYGLYKK  
MIVFKPYQASQHDMCRFHSEDIYIDFLQRVSPNTMQGFTKSLNAPNVGDDCPVFPGLFE  
FCSRYTGASLQATQLNNKICDIANWAGGLHHAKKFEASGFCYVNDIVIGILELLKY  
HPRVLYIDIDIHHGDGVQEAFLYLTDRVMTVSFHKYGNYYFFPGTGDMYEVGAESGRYYC  
LNVPLRDGIDDQSYKHLFPVINQVVDFYQPTCIVLQCGADSLGCDRLGCFNLSIRGH  
CECVEYVKSFNIPPLLVLGGGYTVRNVARCWTYETSLLVEEAISEELPYSEYFIFYAP  
DFTLHPDVSTRIENQSRQYLDQIRQTIFENLKMLNHAPSVQIHDVPADLLTYDRTDE  
ADAEERGPEENYSRPEAPNEFYDGDHDNDKESDVEI (SEQ ID NO:5)

FIG. 3A

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1  ggaattcgcg gccgcggcgg gccgatctct caagaccgtg ggaattcgcg gctccgcgct
61 caagaccgtg gccgatctct caagaccgtg ggaattcgcg gctccgcgct gctccgcgct
121 ccctatgaag ccccatcgcc atcgtcctca taagaaagatg ccccatcgcc atcgtcctca
181 taagaaagatg ccccatcgcc atcgtcctca taagaaagatg ccccatcgcc atcgtcctca
241 ctccgaggac tacattgact aatgccctca cgttacacag gccattaaact
301 caagagtcctt aatgccctca cgttacacag gccattaaact tatgtcaacg
361 gtcttgctcg cgttgatatt ctgtgatat tggcttctgc tgggttgctc
421 ctgtgatat ctgtgatat ctgtgatat tggcttctgc tgggttgctc
481 tggcttctgc tgggttgctc tgggttgctc tgggttgctc tgggttgctc
541 tgggttgctc tgggttgctc tgggttgctc tgggttgctc tgggttgctc
601 cctcactgac caggtcatga atgtatgaag ggcatttgatg ttctaccaac
661 cacaggatgac atgtatgaag ggcatttgatg ttctaccaac ttgggttgct
721 cctgcgggat cctgcgggat cctgcgggat cctgcgggat cctgcgggat
781 ggtagtggtg ggtagtggtg ggtagtggtg ggtagtggtg ggtagtggtg
841 ctgtgatcga ttgtcaagagc ttgtgcccgc gcttccctat agcaccgcgc
901 ttgtcaagagc ttgtgcccgc gcttccctat agcaccgcgc ctttgaaaac
961 ttgtgcccgc gcttccctat agcaccgcgc ctttgaaaac ctgtgagga
1021 gcttccctat agcaccgcgc ctttgaaaac ctgtgagga ttacagatgt
1081 cagcaccgcgc ctttgaaaac ctgtgagga ttacagatgt ggcagacaat
1141 ctttgaaaac ctgtgagga ttacagatgt ggcagacaat acgtgcctgc
1201 agacctcctg gaactatagc gaaagcgatg gaaagcgatg gaaagcgatg
1261 gaactatagc gaaagcgatg gaaagcgatg gaaagcgatg gaaagcgatg
1321 gaaagcgatg gaaagcgatg gaaagcgatg gaaagcgatg gaaagcgatg
1381 cactctcttg cactctcttg cactctcttg cactctcttg cactctcttg
1441 ggggctcttg cactctcttg cactctcttg cactctcttg cactctcttg
1501 cctgctcttg cactctcttg cactctcttg cactctcttg cactctcttg
1561 caaggatagc tatctgggac tatctgggac tatctgggac tatctgggac
1621 ttgcccctta ttctctccct ttctctccct ttctctccct ttctctccct
1681 agacaaggac tgagattgcc tgagattgcc tgagattgcc tgagattgcc
1741 ccttgcttcc aggaagatg aggaagatg aggaagatg aggaagatg
1801 ctgaatccca gatgatgga gatgatgga gatgatgga gatgatgga
1861 ctctcacttt ttgctttatg ttgctttatg ttgctttatg ttgctttatg
1921 attttttgta cctttgatgg cctttgatgg cctttgatgg cctttgatgg

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FIG. 3B



FIG. 4B-1
FIG. 4B-2
FIG. 4B-3
FIG. 4B-4
FIG. 4B-5

FIG. 4B

1 ggaggttgtg gggcgccgc cgggagcac cgtccccgc cgcgccgag gccgccgag cccgagccc  
 61 agcccgcca ccgcccgcg ccgcccgcg cgcgccgag cgcgccgag gccgccgag agcctgggc  
 121 cccggcgcg ccgtggcgc cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 181 cgggtggcg cgcgggtga cgcgggtga cgcgggtga cgcgggtga gccgccgag cgcgccgag  
 241 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 301 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 361 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 421 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 491 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 541 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 601 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 661 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 721 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 781 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 841 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 901 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag  
 961 cgcgccgag cgcgccgag cgcgccgag cgcgccgag cgcgccgag gccgccgag cgcgccgag

FIG. 4B-1



1021 gcgctcaagc agaagcagca gatccagagg cagatcctca tgcccgagtt ccagaggcag  
 1081 cacgagcagc tctcccgca gcacgaggcg cagctccacg agcacatcaa gcaataacag  
 1141 gagatgctgg ccatgaagca ccagcaggag ctgctggaac accagcggaa gctggagagg  
 1201 caccgccagg agcaggagct ggagaaagcag caccggagc agaagctgca gcagctcaag  
 1261 aacaaggaga agggcaaaaga gagtgcctg gccagcacag aagtgaagat gaagttacaa  
 1321 gaatttgtcc tcaataaaaa gaggcgctg gccacaggga atctgaacca ctgcaactcc  
 1381 agagaccctc gctactggtg cgggaaaacg cagcacagtt ccctgacca gagtctcca  
 1441 cccagagcg gagtgtcgac ctctataac caccgggtcc tgggaatgta cgacgccaaa  
 1501 gatgacttcc ctcttaggaa aacagcttct gaaccgaatc tgaatcacg gtccaggcta  
 1561 aagcagaaag tggccgaaag acggagcagc ccctgttac gcaggaaaga cgggccagtg  
 1621 gtactgtctc taaaaaagcg tccgttgat gtacagact ccgctgcag cagcgcacca  
 1681 ggctccggac ccagctcacc caacaacagc tccgggagcg tcgctggag gaacgggtatc  
 1741 gcgccgcccg tcccagcat cccggcggag acgagtttg gcacagact tgtggcacga  
 1801 gaaggctcgg ccgctccact tccctctac acatcgccat ccttgcccaa catcacgctg  
 1861 ggcctgcctg ccacggccc ctctgcgggc acggcgggac agcaggacac cgagagactc  
 1921 acccttcccg ccctccagca gaggctctcc ctcttcccg gcacccacct cactccctac  
 1981 ctgagcacct cgcccttgga gcgggacgga ggggcagcgc acagccctct tctgcagcac  
 2041 atggtcttac tggagcagcc accggcacaa gcacccctcg tcacaggcct ggagtagctg  
 2101 ccctccacg cacagtcctt ggttggtgca gaccgggtgt cccctccat ccacaagctg  
 2161 cggcagcacc gccactggg gcggacccag tcggccccc tgccccagaa cggccaggct  
 2221 ctgcagcacc tggtcattca gcagcagcat cagcagtttc tgagaaaaca caagcagcag  
 2281 tccagcagc agcaactgca gatgaacaag atcatccca agccaagcga gccagcccg  
 2341 cagccggaga gccaccgga ggagacggag gaggagctcc gtgagcacca ggctctgctg  
 2401 gacgagccct acctggacc gctgccggg cagaaggagg cgacgcaca ggccggcgtg  
 2461 caggtgaagc aggagcccat tgagagcgat gaggaaggag cagagccccc acgggagggtg  
 2521 gagccgggcc agcggcagcc cagttagcag gactgtctt tcagacagca agcctctctg  
 2581 ctggagcagc agcggatcca ccagctgagg aactaccagg cgtccatgga gcccgccggc  
 2641 atccccgtgt ccttcggcgg ccacaggcct ctgtcccggg cgagctcctc acccggtct  
 2701 gccaccttcc ccgtgtccgt gcaggagccc cccaccaagc cgaggttcac gacaggcctc  
 2761 gtgtatgaca cgctgatgct gaagcaccag tgcacctgcg ggagtagcag cagccacccc  
 2821 gagcacgccg ggaggatcca gagcatctgg tccgcctgc agaagacggg cctccggggc

FIG. 4B-2

2881 aaatgcgagt gcatccgcgg acgcaaggcc accctggaag agctacagac ggtgcactcg  
 2941 gaagcccaca ccctcctgta tggcacgaac ccctcaacc ggcagaaact ggacagtaag  
 3001 aaacttctag gctcgcctgc ctccgtgttc gtcggctcc cttgcggtgg tgttggggtg  
 3061 gacagtgaca ccatatggaa cgaggtgcac tggcggggcagccgcct ggctgtgggc  
 3121 tgcgtggtag agctggctct caaggtggcc acaggggagc tgaaaaatgg ctttgctgtg  
 3181 gtccgcccc gtgacacca ctggaggag agcacgcca tgggcttttg ctacttcaac  
 3241 tccgcggccg tggcagccaa gcttctgcag gctgtagcaa gcgtgagcaa gatcctcacc  
 3301 gtggactggg acgtgcacca tggaaaacggg accagcagg ctttctacag cgaccctagc  
 3361 gtccgtgata tgtccctcca cgcctacgac gatgggaact tcttcccagg cagcggggct  
 3421 cctgatgagg tgggcacagg gcccggcgtg ggtttcaacg tcaacacggc ttccaccggc  
 3481 ggcctggacc ccccatggg agacgctgag tacttggcg ccttcagaaac ggtggtaatg  
 3541 ccgatacgcca gcgagtttgc ccggatgtg gtgctggtgt catcaggctt cgatgccgtg  
 3601 gagggccacc ccacccctct tgggggctac aacctctcg ccagatgctt cgggtacctg  
 3661 acgaagcagc tgatgggctt ggctggcgcc cggattgtcc tggccctcga gggaggccac  
 3721 gacctgaccg ccatttgcga cgcctcggaa gcatgtgttt ctgccttgct gggaaacgag  
 3781 cttgatcctc tccagaaaa ggttttacag tactggcgct gcctgcagcg cacaacctcc  
 3841 atggagaaag tcatggagat ccacagcaag actgcgaga acgaagaagc cgagacggtc  
 3901 acagcggggc gtctctgat ctaggctcag agcccgcgg aaagagacc agatgaggag  
 3961 accgccatgg cctcgcctgc cgtggacgtg tccctcgaa ctgctgttct cttgtctgtc  
 4021 cccatggaa gtgagccgcc aggtagcac tttcccgtgt cagcctgctg tcccaccgtg  
 4081 tgtctctgtc ttgaagctca gccaaagaaac gctgcaaca gccacgggaa gcctttctgc  
 4141 gggctctctt ggagcaccac cagacgcaca tgcacgcctg ggctgggag cctcacaggg  
 4201 cggccaggcc cagaggtctc agacgccggc gacgcgcaga cacaggacct aagcacactc  
 4261 aacacgggac cgaaggggac gccgtggaag aggcacagaa aacaaatctc aaatacaaaa  
 4321 tggcgggtcc agtgacacg aggtaaaagt gcttaaaagt tattaccac aactcctgtg  
 4381 tggcgaattc caaacttgat taaaacttgt ctcatcttgt agcttatatt ttttttaaa  
 4441 caaacttgat taaaacttgt ctcatcttgt agcttatatt ttttttaaa aggcgttttt  
 4501 aaccactcga ctcatcttgt agcttatatt ttttttaaa aggcgttttt ctacggctgt  
 4561 gggccgcctc tgtgaaccat agcgggtgtgc agaaacagg atgtgagctg gtgggggaca  
 4621 gagggacctt taaagaaaaa aaaactggac agaaacagg atgtgagctg ggggagctgg  
 4681 cttgagtttc tcaaaagcca tcggaagatg cgagtttgtg cctttttttt tattgctctg

FIG. 4B-3

4741 gtggattttt gtggtgggt ttttgaagt ctgaggaaca atgccttaag aaaaaacaaa  
4801 cagcaggaat cgtggggaca gtttcctgtg gccagccgag cctggcagtg ctggcacccg  
4861 gagctggcct gacgcctcaa gacgcctcat ctcggggcc ctcggcagtg agggcctgca  
4921 gcccggcggg ccctgttttg ctttatgtgt gtttaagaaa aatggaggta gttccaaaaa  
4981 agtggcaaat cccgttgag gtttgaagt ccaacaaatt taaacgaat ccaaagtgtt  
5041 ctcacacgtc acatacgatt gagcatctcc atctggtcgt gaagcatgtg gtaggcacac  
5101 ttgcagtgtt acgacggaa tgctttttat taaaagcaag tagcatgaag tattgcttaa  
5161 attttaggta taaataaata tatatatgta taatatatat tccaatgtat tccaagctaa  
5221 gaaacttact tgattcttat gaaatcttga taaatatatt ataatgcatt tatagaaaaa  
5281 gtatatatat atataaaaa tgaatgcaga ttgcgaagg tcccgcaaat gtagggcttg  
5341 tgaatttgct ctcaagggtc ttatggaaag ggatcctgat tgattgaaat tcatgttttc  
5401 tcaagctcca gattggctag atttcagatc gccaacacat tcgccactgg gcaactaccc  
5461 tacaagtttg tactttcatt ttaattattt tctaacagaa ccgctcccgt ctccaagcct  
5521 tcatgcacat atgtacctaa tgagttttta tagcaaaaga tataaatttg ctgttgattt  
5561 ttgtatgaat tttttcacia aaagatcctg aataagcatt gttttatgaa ttttacattt  
5641 ttccacacca tttagcaatt ttccgaatgg taataatgtc taaatctttt tcctttctga  
5701 attcttgctt gtacattttt ttttaccttt caaagggttt taattatttt tgttttttatt  
5761 tttgtacgat gatttttctg cagcgtacag aattgttgc tgcagattct atttcagaa  
5821 agtgagagga gggaccgtag gtcttttctg agtgacacca acgatttgtt ctttcctggg  
5881 ctgtccctagg agctgtataa agaagcccag gggctctttt taactttcaa cactagtagt  
5941 attacgagg gtggtgtgtt ttccctctcc ttggcagatg caggagagg tgcctaggat  
6001 gcccgccac cctgggaggg cctggagggc ttggcagatg ccggggcag tcagcattaa tgaaactcat  
6061 gtttaaaact ctctgaccac atcgtcagga tagaatctta acttgagttt tccaaacacc  
6121 ttttgagcat gtcagcaatg catggggcac acgtgggggt ctttaccac ttgggttttt  
6181 cactgcagc cactggcca gccctggatt ttggagcctg tggctgcaag gaaccaggg  
6241 acccttgttg cctggtgaac ctgcagggag ggtatgattg cctgaccagg acagccagtc  
6301 ttactctttt ttctctcaa cagtaactga cagtcacgtt ttaactggtaa ctatttttc  
6361 agcacatgaa gccaccagtt tcattccaaa gtgtatatgt ggttcagact tgggggcaga  
6421 agttcagaca caccgtgttc aggagggacc cagagccgag tttcggagtt tggtaaaagt  
6481 tacagggtag ctctgaaat taactcaaac ttttgaccac atgagtgcat attcttggat  
6541 tcaacttggt actgggctgc tgatggtcag ctctgagaca gtggtttgag agcaggcaga

FIG. 4B-4

FIG. 4B-5

6601 acggtcttgg gacttgtttg actttccctt cctgggtggc cactctttgc tctgaagccc  
6661 agattggcaa gaggagctgg tccattcccc attcattggca cagaacagtg gcagggccca  
6721 gctagcaggc tcttctggcc tcttggcctt ccttctctgc cattctctct atagccctct ggggatcctg  
6781 ccacctgccc ccttacctga tcttacctga cgtgggctta cgtggaggaa tgcatactct cacttttttt  
6841 ttttaagcag atgatgggat aacatggact aacatggact gctcagtggc caggttatca gtggggggac  
6901 ttaattctaa tctcatcaca tctcatcaca atggagacga cctctgcaaa ggcctggcag ggggaggcaa  
6961 gtttcatctg tcatctcact ccagcttcac ccagcttcac aaatgtgctg agagcattac tgtgtagcct  
7021 tttctttgaa gacacactcg gacacactcg gctcttctcc acagcaagcg tccagggcag atggcagagg  
7081 atctgctcgc gctctcgcag gctctcgcag gctctcgcag gctccttcat gtgttctccc  
7141 tgtgggtcct tggaccttta tggaccttta gcttcttctc tcttctgcaa aggccttggg ggcactggct  
7201 gggagtcagc aagcagcac aagcagcac tttatatccc tttgagggaa accctgatga cgcactggg  
7261 cctcttggcg tctgacctgc cctgacctgc cctgacctgc tccgacctg cgcagcgtg ccacgtgccc  
7321 cagccccac cagcaggcgg cagcaggcgg ggttctggag ggcacttttg tcaagggtgtt tcagtttttc  
7381 cccagcgtc caggggctct caggggctct tttgcaagg ggaaggacca tttcgtaatg gtctgacaca  
7441 ttacttctt ttgaaatct ttgaaatct ttgaaatct agcactagca atggactttg tggcttttct  
7501 aaagcaagtt tgatttttgc agcactagca agcactagca atggactttg tggcttttct  
7561 aacattcctt ctttactggt ctttactggt ctttactggt ctttactggt atcttcttct ttgtagactt  
7621 tgggcccacg tgttttatgg tgttttatgg gcttttatgg ctttactggt atcttcttct ttgtagactt  
7681 gaatacattt ttttaagtgt ttttaagtgt ttttaagtgt ctttactggt atcttcttct ttgtagactt  
7741 ctttatattg tatacagatt tatacagatt tatacagatt ttttaagtgt atcttcttct ttgtagactt  
7801 gcccttctgt tcccctctca tcccctctca tcccctctca ttttaagtgt atcttcttct ttgtagactt  
7861 caaaaacctt gaaggagagg gaaggagagg gaaggagagg aggttgcgtc ttaattgaact tttcttaag  
7921 aaattgtact ttttatgtta ttttatgtta ttttatgtta aaaggactac ttaaacattt gtcatattaa  
7981 gaaaaaaagt ttatctagca ttatctagca ttatctagca accaataata gactttattg tatttatgtg  
8041 gaaacagtgt tttagggaat tttagggaat tttagggaat tttagggaat actgacctgtc tctctcagat  
8101 tgatttggag gaattttgtt gaattttgtt gaattttgtt ttttctgca cgtctgtgtt gactttttaa  
8161 gccaggcgag cgcggccgcg cgcggccgcg cgcggccgcg cgtctgacgg ttttatctga ttgagaactg  
8221 ggcggactcg aaagagtccc aaagagtccc aaagagtccc ctttctcga cgtctgtgtt gactttttaa  
8281 gtgatgtatg gctaagattt gctaagattt gctaagattt cactttaagc agtcgtgaac tgtgcgagca  
8341 caattatact ttgcatacga ttgcatacga ttgcatacga tttctcattg taacgaagct ctgtggttta  
8401 ttagctcggc ctcactttgt ctcactttgt ctcactttgt gattaaaagt ctgctattga aagaaaaag (SEQ ID NO: 8)

LRQGGTLTGKFMSTSSIPGCLLGVALEGDGSPGHASLLQHVL  
LEQARQQSTLIAVPLHGQSPLVTGERVATSMRTVGKLP  
RHRPLSRTQSSPLPQSPQAL  
QQLVMQQQHQQFLEKQKQQQLQLGKILTKTGELPRQPT  
THPEETEELTEQQEVLLGE  
GALTMPREGSTESESTQEDLEEEDEEEDGEEEDCIQVK  
DEEGESGAEEGPDLEEPGA  
GYKKLFSDAQPLQPLQYQAPLSLATVPHQALGRTQSS  
PAAPGGMKSPDPQPVKHLFT  
TGVVYDTFMLKHQCMCGNTHVHPEHAGRIQSIWSRLQ  
ETGLLSKCERIRGRKATLDEI  
QTVHSEYIHTLLYGTSPLNRQKLDKLLGPISQKMYAV  
LPCGGIGVSDTVWNEMHSS  
SAVRMAVGCLLELAFKVAAGELKNGFAIIRPPGHHAE  
ESTAMGFCFFNSVAITAKLLQ  
QKLNVGKVLIVDWDIHHGNGTQQAFYNDPSVLYISLH  
RYDNGNFFPGSGAPEEVGGGP  
GVGYNVNVAWTGGVDPPIGDVEYLTAFRTVVMPIAHE  
FSPDVVTLVSAGFDAVEGHLSP  
LGGYSVTARCFGHLTRQLMTLAGGRVVLALEGGHDLT  
AICDASEACVSALLSVELQPL  
DELVLQQKPNINAVATLEKVIETQSKHWSVCVKFAAG  
LGRSLREAQAGETEEAETVSA  
MALLSVGAEQAAAAAREHSPPRAEPEMEQEPAL (SEQ  
ID NO:9)

FIG. 5A

FIG.5B-1
FIG. 5B-2

FIG. 5B

1 ccctgcggca gggtagcag ggttagcag ctgaccggca agttcatgag cacatcctct attcctggct  
61 gcctgctggg cgtggcactg gtaggcacag ggagcccca cgggcctct cccctgctgc  
121 agcatgtgct gttgctggag gtaggcggc agcagagcac cctcatgct gtgccaactc  
181 acgggcagtc ccactagtg ccactagtg acgggtgaac gtgtggcac cagcatgcgg acggtaggca  
241 agtcccgcg gcatcggccc ctgagccgca ctgagtcctc accgctgcg cagagtcccc  
301 agggcctgca gcagctggtc atgcaacaac agcaccagca gttcctggag aagcagaagc  
361 agcagcagct acagctggg acagctggg aagatcctca ccaagacagg ggagctgccc aggcagccca  
421 ccaccacccc tgaggagaca gaggaggagc tgacggagca gcaggaggtc ttgctggggg  
481 agggagccct gaccatgccc gaccatgccc ccacagagag tgagagcaca caggagacc  
541 tggaggagga gacgaggaa gaggatgggg agggaggagg aggtgcatc gggttaagg  
601 acgaggaggg cgagagtgtt gctgaggagg gcccgcactt ggaggagcct ggtgctggat  
661 acaaaaaact gttctcagat gcccagccgc tgcagccttt gcaggtgtac caggcgcccc  
721 tcagcctggc cactgtgccc caccaggccc tgggccgtac ccagtcctcc cctgctgccc  
781 ctggggggcat gaagagcccc ccagaccagc ccgtcaagca cctctcacc acaggtgtgg  
841 tctacgacac gttcatgcta aagcaccagt gcatgtgcgg gaacacacac gtgcaccctg

FIG. 5B-1

901 agcatgctgg ccggtaccag agcatctggt cccggctgca ggagacaggg ctgcttagca  
 961 agtgcgagcg gatccgaggt cgcaaagcca cgctagatga gatccagaca gtgactctg  
 1021 aataccacac cctgctctac gggaccagtc cctcaaccg gcagaagcta gacagcaaga  
 1081 agttgctcgg cccatcagc cagaagatgt atgctgtgct gccttgctgg ggcatcgggg  
 1141 tggacagtga caccgtgtgg aatgagatgc actcctccag tgctgtgctg atggcagtgg  
 1201 gctgcctgct ggagctggcc ttcaaggtgg ctgcaggaga gctcaagaat ggatttgcca  
 1261 tcatccggcc ccaggacac caccggagg aatccacagc caccggattc tgcttcttca  
 1321 actctgtagc catcacgca aaactcctac agcagaagt gaaagtgggc aaggtcctca  
 1381 tcgtggactg ggacattcac catggcaatg gacccagca ggcgttctat aatgacccct  
 1441 ctgtgctcta catctctctg catcgctatg acaacgggaa ctcttctcca ggctctgggg  
 1501 ctctgaaga ggttggtgga ggaccaggcg tggggtacaa tgtgaacgtg gcatggacag  
 1561 gaggtgtgga ccccccatt ggagacgtgg agtaccttac agccttcagg acagtgggtga  
 1621 tgcccatcgc ccacgagttc tcacctgatg tggctcctagt ctccgccggg tttgatgctg  
 1681 ttgaaggaca tctgtctcct ctgggtggct actctgtcac cgcagatgt tttggccact  
 1741 tgaccaggca gctgatgacc ctggcagggg gccgggtggt gctggccctg gagggaggcc  
 1801 atgacttgac cgccatctgt gatgcctctg aggccttggt ctccgctctg ctgagtgtag  
 1861 agctgcagcc ctgggatgag gcagtcttgc agcaaaagcc caacatcaac gcagtggcca  
 1921 cgctagagaa agtcatcgag atccagagca aacactggag ctgtgtgcag aagttcgccg  
 1981 ctggtcttgg ccggtccctg cgagaggccc aagcaggtga gccgaggag gccgagactg  
 2041 tgagcgccat ggccttgctg tcggtggggg ccgagcaggc ccaggctgcg gcagcccggg  
 2101 aacacagccc caggccggca gaggagccca tggagcagga gcctgccctg tgacgccccg  
 2161 gccccatcc ctctcggctt caccattgtg attttgttta ttttttctat taaaaacaaa  
 2221 aagtcacaca ttc (SEQ ID NO:10)

FIG. 5B-2

1 mtstgqdstt trqrrsrqnp qspqqdssvt skrnikkav prsipnlaev kkkgkmmkklg  
61 gameedlivg lqgmdlnlea ealagtglvl deqlnefhcl wddsfpegpe rlhaikeqli  
121 qeglldrcvs fqarfaekee lmlvhsleyi dlmettqymn egelrvladt ydsvylhpns  
181 yscacilasgs vlrlvdavlg aeirngmai rppghhaqhs lmdgycmfhn vavaaryaqq  
241 khrrirrvliv dwdvhhgqgt qftfdqdpv lyfsihryeq grfwphlka nwtstgfgqg  
301 ggytinvpwn qvgmrdadyi aafhlvllpv alefqpqlvl vaagfdalqg dpkgemaatp  
361 agfaqlthll mglaggklil sleggynira laegvsaslh tllgdpcpml espgapcrsa  
421 qasvscalea lepfwevlvr stetverdnm eednveese egpweppvlp iltwvplqsr  
481 tglvydqnm ncnlwdshh pevpprilri morleelgia grcltltprp ateaelltch  
541 saeyvghlra tekmtrelh ressnfdsiy icpstfacaq latgaacrly eavisgevin  
601 gaavvrppgh haeqdaacgf cffnsvavaa rhaqtisgha lrilivdvdv hhngtqhmf  
661 eddpsvlyvs lhrydhgtff pmgdegassq igraagtgt vnvawngprm gdadylaawh  
721 rlvlpiafef npelvlvsag fdaargdplg gcqvspegya hlthllmgl sgrilileg  
781 gynltsises maactrsilg dpplltlpr pplsgalasi tetiqvhrry wrslrvmkve  
841 dregpssskl vtkkapqpak prlaermtrr ekkvleagmg kvtsasfgee stpgqtnset  
901 avvalcqdpq seaatggatl aqtiseaag gamlgqttse eavggatpdq ttseetvga  
961 ildqtseda vggatigqtt seeavggatl aqtiseame gatldqttse eapggtelic  
1021 tplasstdhq tpptspvqgt tpqispstli gslrtlelgs esqgasesqa pgeenllgea  
1081 agggqmadsm lmqgsrgltd gaifyavtpl pwcphlvavc pipaagldvt qpcgdcgtic  
1141 enwvclscyq vycgryingh mlqhhgnsgh plvlsyidl s awcyycayv hhqalldvkn  
1201 iahqnkfged mphph (SEQ ID:11)

FIG. 6A



FIG. 6B-1
FIG. 6B-2
FIG. 6B-3

FIG. 6B

1 gggcagtccc ctgaggagcg gggctggttg aaacgctagg ggcgggatct ggcggagtgg  
61 aagaaccgcg gcaggggcca agcctcctca actatgacct caaccggcca ggattccacc  
121 acaaccaggc agcgaagaag taggcagaac cccagtcgc ccctcagga ctccagtgtc  
181 actcgaagc gaaatatata aaagggagcc gtccccgct ctatcccaa tctagcggag  
241 gtaaagaaga aaggcaaaat gaagaagctc ggccaagcaa tggagaaga cctaactgtg  
301 ggaactgcaag ggatggatct gaacctcgag gctgaagcac tggctggcac tggcttgggtg  
361 ttggatgagc agttaatga attccattgc ctctgggatg acagcttccc ggaaggccct  
421 gagcggctcc atgccatcaa ggagcaactg atccaggagg gcctcctaga tcgctgcgtg  
481 tccttcagg cccggtttgc tgaaaaggaa gagctgatgt tggttcacag cctagaatat

FIG. 6B-1

541 attgacctga tggaaacaac ccagtacatg aatgaggagg aactccgtgt cctagcagac  
601 acccagact cagtttatct gcataccgaac tcatactcct gtgcctgcct gccctcaggc  
661 tctgtcctca ggctgtgga tgcggtcctg ggggctgaga tccggaacgg catggccatc  
721 attagggcctc ctggacatca cggccagcac agtcttatgg atggctattg catgttcaac  
781 cacgtggctg tggcagccc ctagctcaa cagaacacac gcacccggag ggtccttatc  
841 gtagattggg atgtgcacca cggtaagga acacagttca cctcgacca ggacccagt  
901 gtccctctatt tctccatcca ccgtacgag cagggtagggt tctggcccca cctgaaggcc  
961 tctaaactggt ccaccacagg ttctggccaa ggccaaggat ataccatcaa tgtgccttgg  
1021 aaccaggctg ggatgcggga tgcctgactac attgctgctt tcctgcacgt cctgctgcca  
1081 gtcgccctcg agctccagcc tcagctggtc ctggtggccg ctggatttga tggcctgcaa  
1141 ggggacccca agggcgagat ggccgcaact ccggcagggt tcgccagct aaccacctg  
1201 ctcatgggtc tggcaggagg caagctgac ctgtctctgg agggtggcta caacctccgc  
1261 gccctggctg aaggcgtcag tgcttcgctc cacaccctc caccaggggt cgggagaccc  
1321 ccggagtcac ctggtgcccc ctgccggagc gccaggctt cagtttctctg tgctctggaa  
1381 gccctgagc cctctggga ggttcttgtg agatcaactg agaccgtgga cctgtgtctc  
1441 atggaggagg acaatgtaga ggagagcgag gaggaaaggac cctgggagcc cctgtgtctc  
1501 ccaatccctga calggccagt gctacagtct cgcacaggcc tggctctatga ccaaaatatg  
1561 atgaatact gcaacttgtg ggacagccac caccctgagg taccacagcg catcttgccg  
1621 atcatgtgcc gtctggagga gctgggccc gctgggccc gctcacctt gcacaccgcc  
1681 cctgccacag aggtgagct gctcacctgt caccgtgctg agtacgtggg tcatctccgg  
1741 gccacagaga aatgaaaac ccgggagctg caccgtgaga gtccaactt tgaactccatc  
1801 tatatctgcc ccagtacctt cgcctgtgca cagcttgcca ctggcgctgc ctggccgctg  
1861 gtggaggctg tgctctcagg agaggtcctg aatggtgctg ttttgctttt tcaactctgt  
1921 caccacgcag agcaggatgc agcttgccgtt ttttgctttt gccctacgga ggtgtggct  
1981 gctcggccatg ccagactat cagtgggcat gccctacgga tccctgattgt ggattgggat  
2041 gtccaccacg gtaatggaac tcagcacatg tttgaggatg acccagtggt gctatatgtg  
2101 tccctgcacc gctatgatca tggcaccttc tccccatgg gggatgaggg tggcagcagc  
2161 cagatcggcc gggccgccc caccaggttc accgtcaacg tggcatggaa cgggccccgc  
2221 atgggtgatg ctgactacct agctgcctgg catcgctggg tgcctcccat tgcctacgag  
2281 tttaaccacg aactggtgct ggtctcagct ggctttgatg ctgcacgggg ggatccgctg

FIG. 6B-2

2341 gggggctgcc agtgtcacc tgagggttat gccacctca ccacctgct gatggcctt  
 2401 gccagtggcc gcattatcct taccctagag ggtggctata acctgacatc catctcagag  
 2461 tccatggctg cctgcactcg cctcctcctt ggagaccac caccctgct gacctgcca  
 2521 cggccccac tatcagggc cctggcctca atcactgaga ccaccaagt ccatcgcaga  
 2581 tactggcgca gctacgggt catgaaggca gaagacagag agggaccctc cagttctaag  
 2641 ttggtcacca agaaggcacc ccaaccagc aacctaggt tagctgagcg gatgaccaca  
 2701 cgagaaaaga aggttcttga agcagggcatg gggaaagtca cctcggcatc atttggggaa  
 2761 ggtccactc cagggcagac taactcagag acagctgtgg tggccctcac tcaggaccag  
 2821 cctcagagg cagccacagg gggagccact ctggcccaga ccatttctga ggcagccatt  
 2881 gggggagcca tgctgggcca gaccacctca gaggaggctg tcgggggagc cactccggac  
 2941 cagaccact cagaggagac tgtgggagga gccattctgg accagaccac ctcagaggat  
 3001 gctgttgggg gagccacgct gggccagact acctcagagg aggtgttagg aggagctaca  
 3061 ctggcccaga ccattctgga ggcagccatg gagggagcca cactggacca gactacgtca  
 3121 gaggaggctc cagggggcac cgagctgac caaactcctc tagcctcgag cacagaccac  
 3181 cagaccccc caactcacc tgtgcaggga actacacccc agatatctcc cagtacactg  
 3241 attgggagtc tcaggacctt ggagctaggc agcgaacctC agggggcctc agaactctcag  
 3301 gccccaggag aggagaacct accaggagag gcagctggag gtcaggacat ggctgattcg  
 3361 atgctgacg agggatctag gggcctcact gatcaggcca tattttatgc tgtgacacca  
 3421 ctgccctggt gtccccattc gttggcagta tggcccatc ctgcagcagg cctagacgtg  
 3481 acccaacctt gtggggactg tggaacaatc caagagaact caagatgctcc aactctgga  
 3541 caggtctacc gtggtcgtta catcaatggc cacatgctcc gttactactg tcaggcctat  
 3601 caccgctgg tcctcagcca catcgacctg tccagcctggc accagaacaa gtttggggag  
 3661 gtccaccacc aggtctctct agatgtgaag aacatcgccc accagaacaa gtttggggag  
 3721 gatatgcccc acccacata agccccagaa tacggtccct cttcaccttc tgaggccac  
 3781 gatagaccag ttccagcctg ttccaggctg taccttggat gaggggtagc ctccactgc  
 3841 atcccatcct gaatatcctt tgcaactccc caagagtgtt tatttaagtg ttaatacttt  
 3901 taagagaact gcgacgatta attgtggatc tccccctgcc catcgcccgc ttgaggggca  
 3961 ccaactactcc agcccagaag gaaagggggg cagctcagtg gcccraagag ggagccgata  
 4021 tcatgaggat aacattggcg ggaggggagt taactggcag gcattggcaag gttgcatatg  
 4081 taataaagta caagctgtt (SEQ ID NO: 12)

FIG. 6B-3

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1  mdlrvgqrpp      vepppeptll  alqrpqrlhh  hlflaglqqq  rsvepmrlsm  dtpmpelqvg
61  pqeqlrqll      hkdkskrsav  assvvkqla  evilkkqaa  lertvhnsp  gipyrtlepi
121 etegatrsm1     ssflppvpsi  psdppehfp1 rktvsepnlk lrykpksle  rrknpllrke
181 sappslrrrp     aetlgdssps  sstpasgcs  spndsehgn  pilgdsdrrt hptlgprgpi
241 lgsphtplfl     phglepeagg  clpsrlqpil lldpsgshap  lltpvglgpl pfhfaqsimt
301 terlsgsgh      wplsrtsep  lppsatappp  pgpmqprleq lkthvqvkr  sakpsekprl
361 rqipsaedle     tdgggpggv  ddglehrelg  hgqpearpa  plqqhvpqvi weqqlagr1
421 prgstgdcvi     lplaqgghrp lsraqsspa  pasisapepa sqarvlssse tpartlpflt
481 gliydsvm1k     hqscgdnsr  hpehagriqs  iwsrlqergl rsqceclgr  kasieelqsv
541 hserhvllyg     tnplsrlkl  ngklag1iaq  rmfemlpcgg  vgvdtitiwn elhssnaarw
601 aagsvtdlaf     kvasrelkng favvrppghh  adhstamgfc  ffnsvaiacr  qlqqqskask
661 askilivdwd     vhhngtqqt  fyqdpvlyi  slhrhddgnf  fpgsgavdev  gagsgegfnv
721 nvawaggldp     pmgdpeylaa frivvmpiar  efspdlvlvs  agfdaaeghp  aplggyhvsa
781 kcfgymtqq1     mnlaggavv1 alegghd1ta  icdaseacva  allgnrvdpl  seegwkqkpq
841 pqchplsgr      dpgaq (SEQ ID NO:13)

```

FIG. 7A

FIG. 7B-1

FIG. 7B-2

FIG. 7B

21/37

1 ataataaccta ccttgcagga ccacgacagg attaagtgag gaaaaacccc catgagagtg  
61 ttttggcatt gtcaagttag cctgagggag gctgaggggg gatcaggctg tatcatgccc  
121 ccgaggacaa actttccagt ttaccctgct cctctctctt gtccttaggc tgccccaggc  
181 cctgcgcaga cacaccaggc cctcagccgc agcccatgga cctgcgggtg ggcacgaggc  
241 cccagtgga gccccacca gagccacat tgctggccct gcagcgtccc cagcgcctgc  
301 accaccact ttccctagca ggcctgcagc agcagcgtc ggtggagccc atgaggctct  
361 ccatggacac gccgacgccc gagttgcagg tgggacccca ggaacaagag ctgcggcagg  
421 ttctccacaa ggacaagagc aagcgaagtg ctgtagccag cagcgtggtc aagcagaagc  
481 tagcggagggt gattctgaaa aacagcagg cggccctaga aagaacagtc catcccaaca  
541 gcccgcggcat tccctacaga acccgggagc cctgggagac ggaaggagcc acccgctcca  
601 tgctcagcag ccttcgcct cctgctcca gcccgcctag tgaccccca gacactccc  
661 ctctgcgcaa gacagtctct gaccccaacc tgaagctgcg ccataagccc aagaagtccc  
721 cggagcggag gaccctcgga gactcctccc agtagtagtgc gccccccagc cccggcggc  
781 ggcccgcaga gaccctcgga gactcctccc caagtagtag cagcacgccc gcatcaggggt  
841 gcagtcccc ccagtgcagc caatgcagc gagcacggcc ccaatcccat cctgggcgac agtgaccgca  
901 ggaccatcc gactctgggc cccggggggc caatcctggg gagccccac actcccctct  
961 tcctgccccca tggcttggag cccgaggctg ggggcacctt gccctccccg ctgcagccca  
1021 tcctctcctt ggaccctca ggcctcctat ggcctctgct cccgctgccc gactgtgggc  
1081 ccttgccctt ccactttgcc cactctttaa agcacccga gcggctctct gggctcaggcc  
1141 tccactggcc actgagccgg actcgtctag agccctgccc cccagtgcc accgctcccc  
1201 caccgcccgg cccatgcag cccgcctgg agcagctcaa aactcacgtc caggtgatca  
1261 agaggtcagc caagccgagt gagaagcccc ggctgcggca gataccctcg gctgaagacc  
1321 tggagacaga tggcggggga ccgggccagg tggtggaaga cggcccgag cacagggagc

FIG. 7B-1

1381 tgggccatgg gcagcccgag gccagaggcc ccgctcctct ccagcagcac ctcaggtgtg  
 1441 tgctctggga acagcagcga ctggctgggc ggctccccc gggcagcacc ggggacactg  
 1501 tgctgcttcc tctggccag ggtgggcacc ggctctgtc ccgggctcag tcttcccag  
 1561 ccgcacctgc ctcaactgtca gccccagagc ctgccagcca ggcccgagtc ctctccagct  
 1621 cagagacccc tgcaggacc ctgcccttca ccacagggct gatctatgac tcggtcatgc  
 1681 tgaagcacca gtgctcctgc ggtgacaaca gcaggcaccc ggagcacgcc ggccgcaccc  
 1741 agagcatctg gtcccggctg caggagcggg ggccctcggag ccagtgtgag tgtctccgag  
 1801 gccggaaggc ctccctggaa gagctgcagt cggtcactc cggcggcac tgcctcctct  
 1861 acggcaccaa ccgctcagc cgcctcaaac tggacaacgg gaagctggca gggctcctgg  
 1921 cacagcggat gtttgagatg ctgccctgtg gtggggttgg ggtggacact gacaccatct  
 1981 ggaatgagct tcattccLcc aatgcagccc gctgggccc gtcagctgtc tggcagtgtc actgacctcg  
 2041 ccttcaaagt ggcttctcgt gagctaaaga atggtttcgc atggtgtcgg tgtggtgtcgg ccccaggac  
 2101 accatgcaga tcattcaaca gccatgggct tctgcttctt caactcagtg gccatcgctt  
 2161 gccggcagct gcaacagcag agcaaggcca gcaaggccag caagatcctc attgtagact  
 2221 gggacgtgca ccatggcaac ggcaccagc aaaccttcta ccaagacccc agtgtgctct  
 2281 acatctccct gcatagccat ggcagcggc gacgacggca acttcttccc ggggagtggg gctgtggatg  
 2341 aggtaggggc tggcagcggc gagggttca atgtcaatgt ggctggggc ggaggtcttg  
 2401 acccccccac gggggatcct gagtacctgg ctgctttcag gatagtctg acgccatcg  
 2461 cccgagagtt ctctccagac ctagtccctgg tgtctgccgg atttgatgct gctgaggggtc  
 2521 acccgcccc acLgggtggc taccatgtt ctgccaaatg ttttggatac atgacgcagc  
 2581 aactgatgaa cctggcagga ggcgcagtgg tgctggcctt ggaggggtggc catgacctca  
 2641 cagccatctg tgacgcctct gaggcctgtg tggctgctct tctgggtaac aggggtggatc  
 2701 ccttttcaga agaaggctgg aaacagaaac ccaacctca atgccactcg ctctctggag  
 2761 gccgtgatcc ggggtgcacag taaatactgg ggctgcatgc agcgcctggc ctccctgtcca  
 2821 gactcctggg tgcctagagt gccaggggct gacaaagaag aagtggaggc agtgaccgca  
 2881 ctggcgtccc tctctgtggg catcctggct gaagataggc cctcggagca gctgggtggag  
 2941 gaggaagaac ctatgaatct ctaaggctct ggaacctct gcccgcccac catgcccttg  
 3001 ggacctgggt ctcttctaac ccctggcaat agccccatt cctgggtctt tagagatcct  
 3061 gtgggcaagt agttggaacc agagaacagc ctgcctgctt tgacagttat ccaggggagc  
 3121 gtgagaaaat c (SEQ ID NO:14)

FIG. 7B-2

1 meepeepads gqslvpvyiy speyvsmcnds lakipkrasm vhsliedayal hkqmrivkpk  
61 vasmeematf htdaylqlhlq kvsqegdddh pdsieyglgy dcpategifd yaaaiggati  
121 taaqclidgm ckvainwsgg whhakdeas gfcylndavl gilrlrrkfe rilyvdldlh  
181 hgdgvedafs ftskvmtvsl hkfspgffpg tgdvsdvglg kgryysvnpv iqdgigdeky  
241 yqicesvlke vyqafnpkav vlqlgadtia gdpmcfnmt pvgigkclky ilqwqlatli  
301 lggggynlan tarcwtyltg vilgktsse ipdbefftay gpdyvleith scrpdrneph  
361 riqqilnyik gnlkhvv (SEQ ID NO:15)

FIG. 8A

1 gaaattcggc acgagctcgt gccgaattcg gcacgagaac ggtttaagc ggaagatgga  
61 ggagccggag gaaccggcgg acagtgggca gtcgctggtc ccggtttata tctatagtcc  
121 cgagtatgc agtatgtgtg actccctggc caagatccc aacgggcca gtatggtgca  
181 ttctttgatt gaagcatatg cactgcataa gcaaatgagg atagttaagc ctaagtggc  
241 ctccatggag gagatggcca cttccacac tgatgcttat ctgcagcatc tccagaaggt  
301 cagccaagag ggcgatgatg atcatccgga ctccatagaa tatgggctag gttatgactg  
361 ccagccact gaagggatat ttgactatgc agcagctata ggaggggcta cgatcacagc  
421 tgcccaatgc ctgattgacg gaatgtgcaa agtagcaatc aactggctcg gagggaggca  
481 tcatgcaaa aaagatgaag catctggttt tcgttatctc aatgatgctg tcctgggaat  
541 attacgattg cgacggaaat ttgagcgtat ccctacgtg gattcggatc tgcaccatgg  
601 agatggtgta gaagacgcat tcagttcac ctccaaagtc atgaccgtgt ccctgcacaa  
661 attctcccca ggattttttcc caggaacagg tgacgtgtcc gacgttggcc tagggaaagg  
721 acggtactac agtgtaaatg tgcccatcca gcatggcata caagatgaaa aatatacca  
781 gatctgcgaa agtgtactaa aggaagtata ccaagccttt aatcccaaag cagtgttctt  
841 acagctggga gccgacacaa tagctgggga tcccatgtgc tcctttaaca tgactccagt  
901 gggaattggc aagtgtctca agtacctcc tcaatggcag ttggcaacac tcatttcggg  
961 aggaggaggc tataaccttg ccaacacggc tcgatgctgg acatacttga ccggggtcat  
1021 ctaggggaaa acactatcct ctgagatccc agatcatgag ttttccacag catatggtcc  
1081 tgattatgtg ctggaaatca cgccaagctg ccggccagac cgcaatgagc ccaccggaat  
1141 ccaacaaatc ctcaactaca tcaaagggaa tctgaagcat gtggtctagt tgacagaaag  
1201 agatcagggtt tccagagctg aggagtgggtg cctataatga agacagcgtg ttatgcaag  
1261 cagtttgrgg aatttgtgac tgcagggaaa atttgaaaga aattacttcc tgaataattc  
1321 caaggggcat caagtggcag ctggcttctt ggggtgaaga ggcaggcacc ccagagtcct  
1381 caactggacc taggggaaga aggagatarc ccacatttaa agttcttatt taaaaaaca  
1441 cacacacaca aatgaaattt ttaatctttg aaaattattt ttaagcgaat tggggagggg  
1501 agtattttaa tcatcttaaa tgaacagat cagaagctgg atgagagcag tcaccagttt  
1561 taggggcagg aggcagctga caggcagggn tngggcctcn ggaccancca ngtggagccc  
1621 tgggagagan ggtactgac ngcagactgg gagg (SEQ ID NO:16)



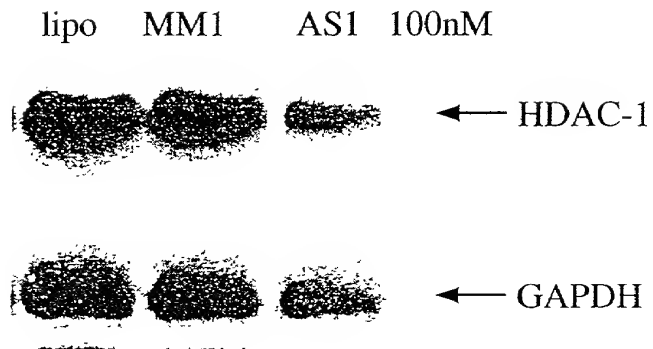


FIG. 9A

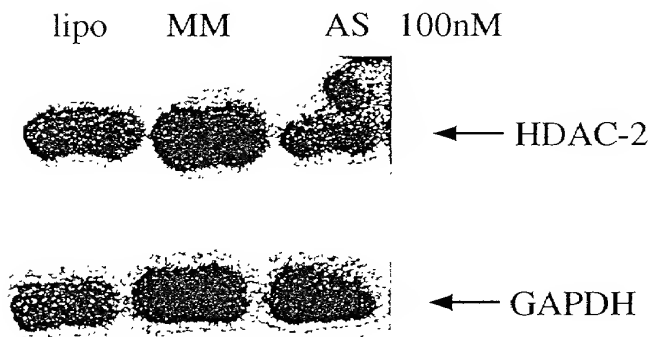


FIG. 9B

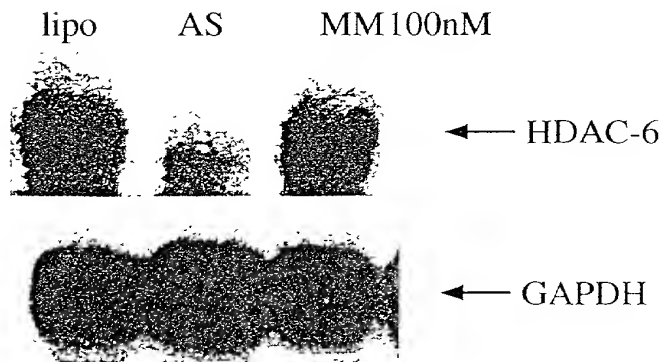


FIG. 9C

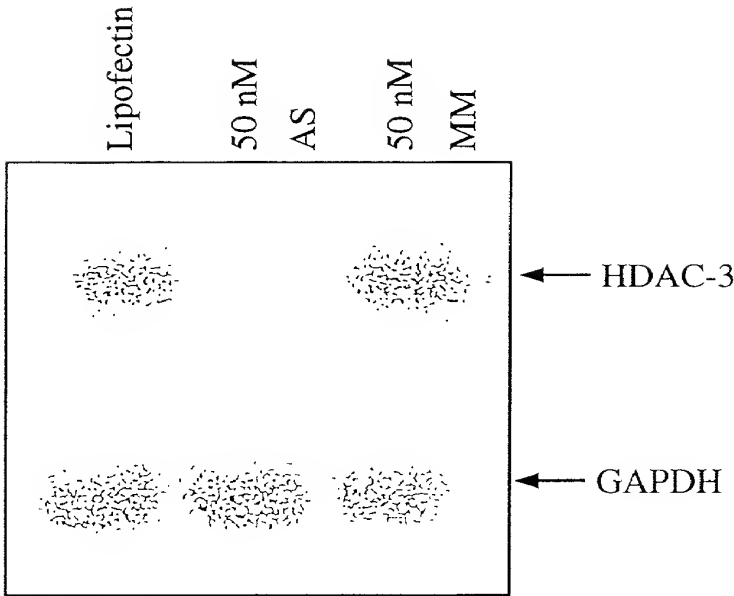


FIG. 9D

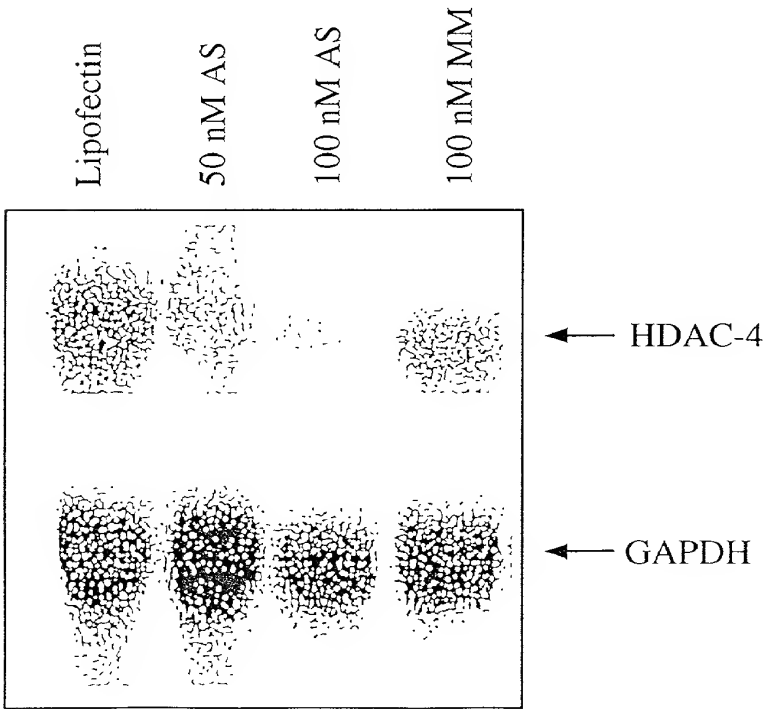


FIG. 9E

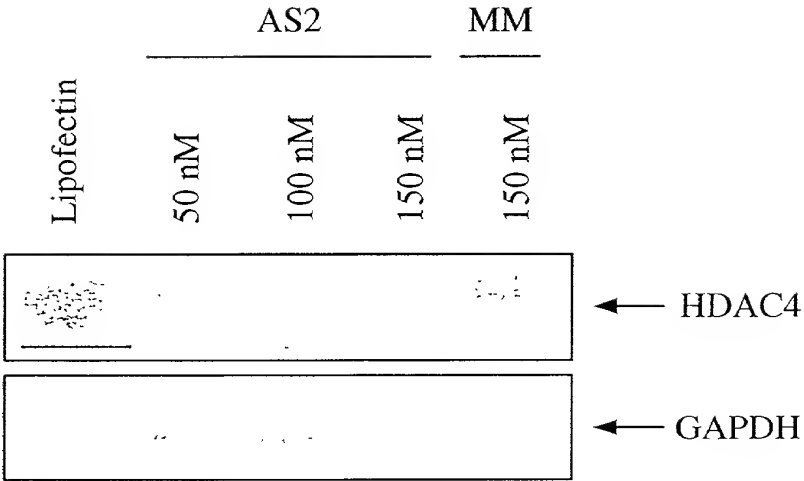


FIG. 9F

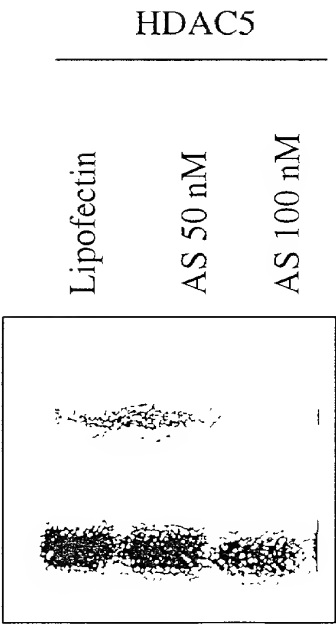


FIG. 9G

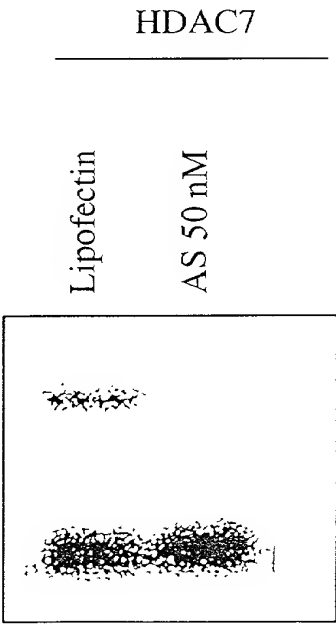


FIG. 9H

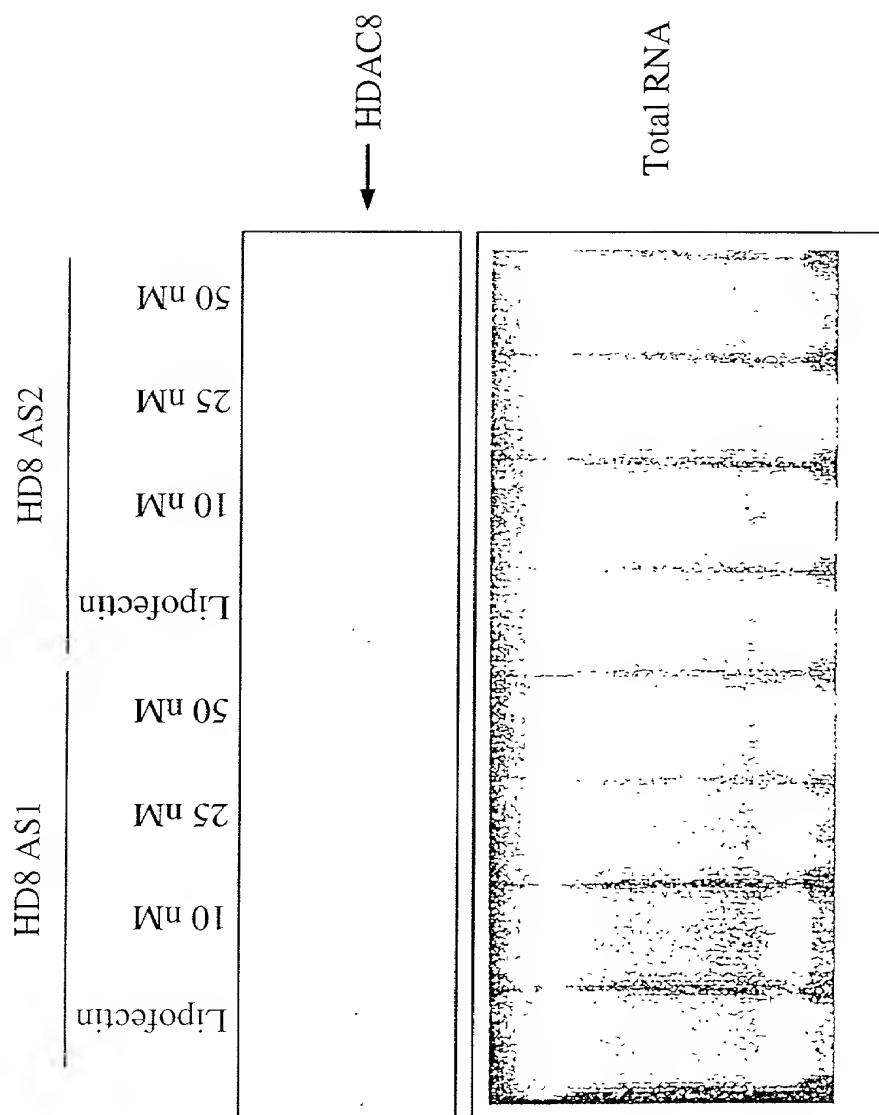
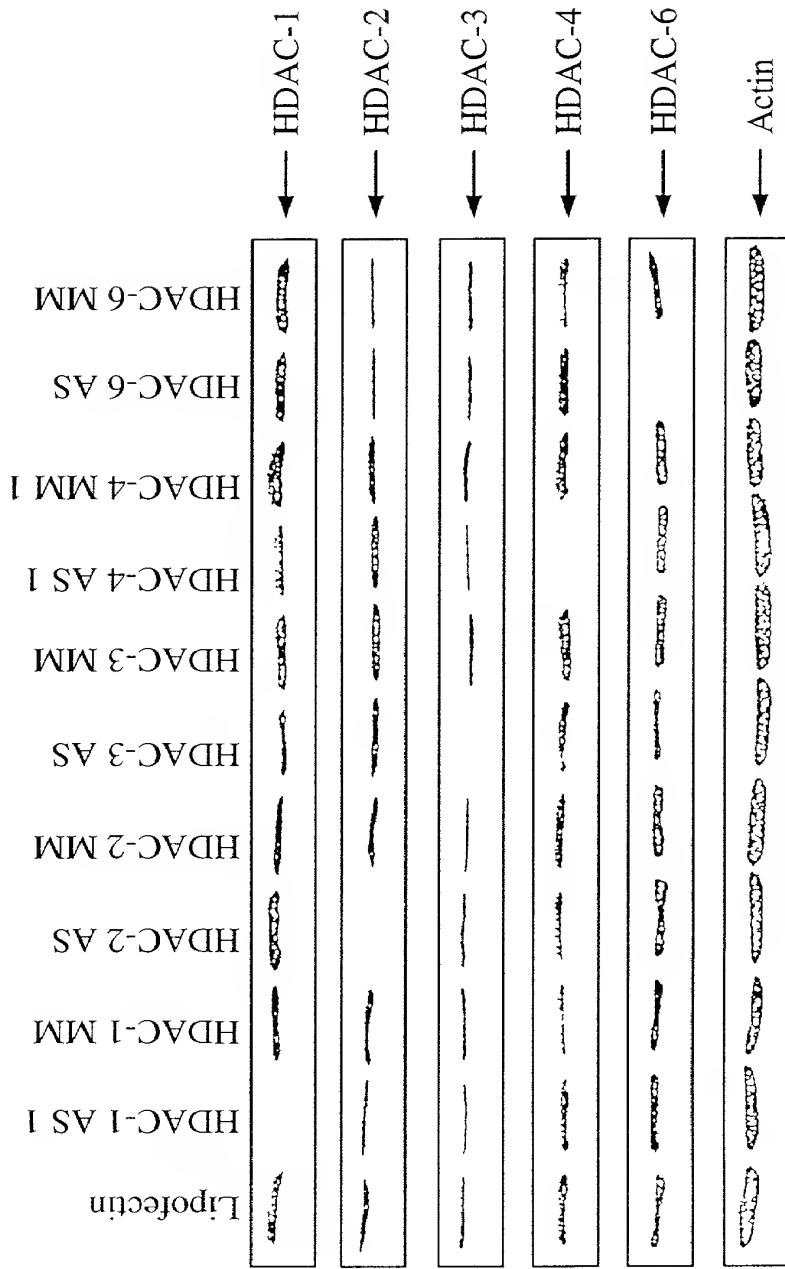


FIG. 9I



AS = Antisense  
MM = Mismatch  
NS = Non-specific control  
3 day treatment  
Oligonucleotide concentration – 50nM

FIG. 10A

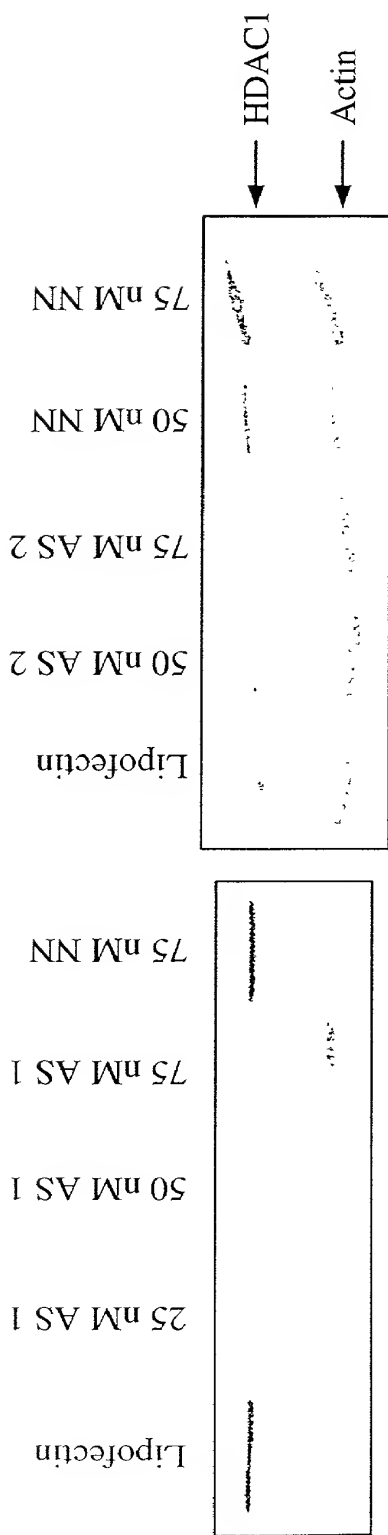


FIG. 10B

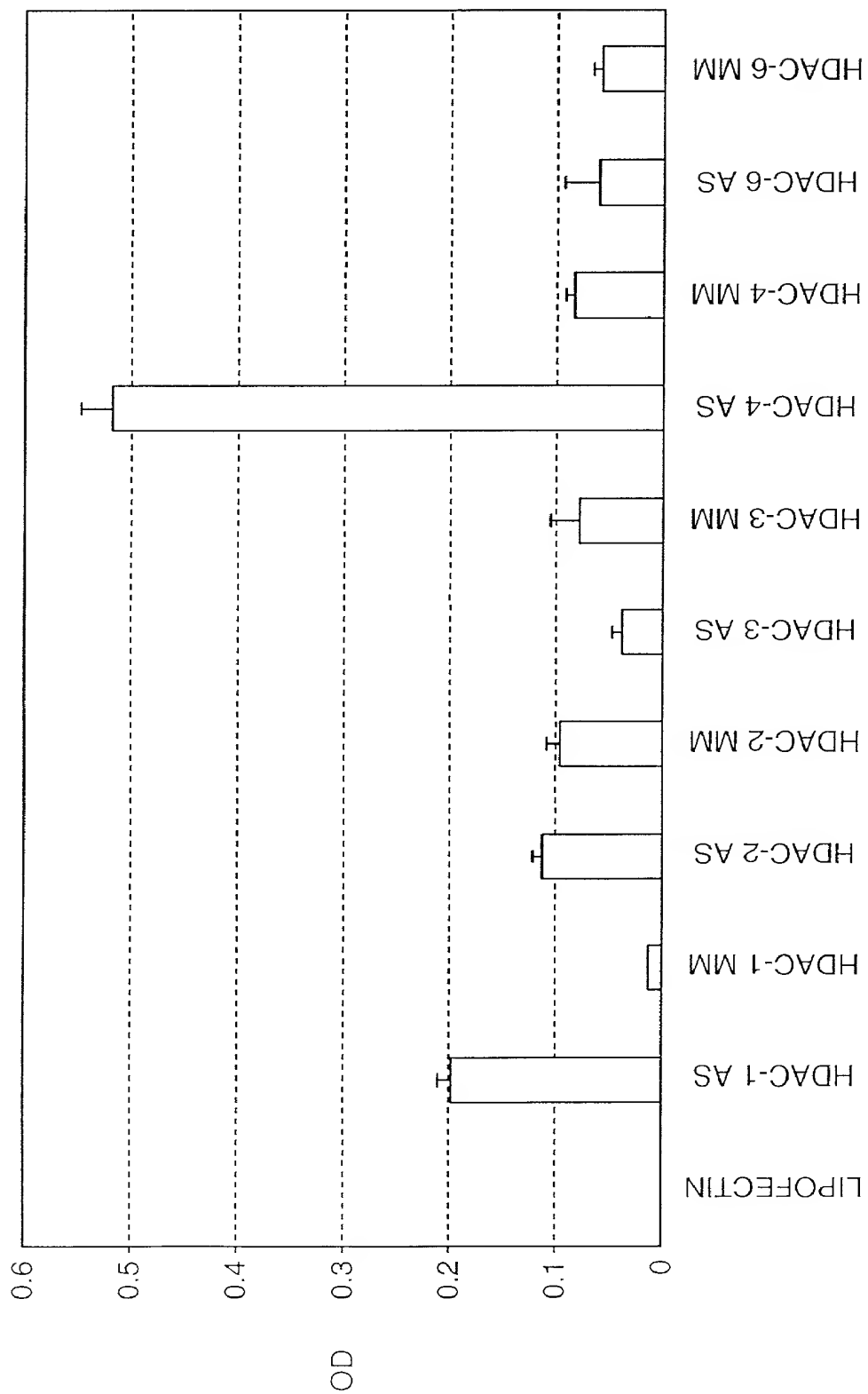


FIG. 11

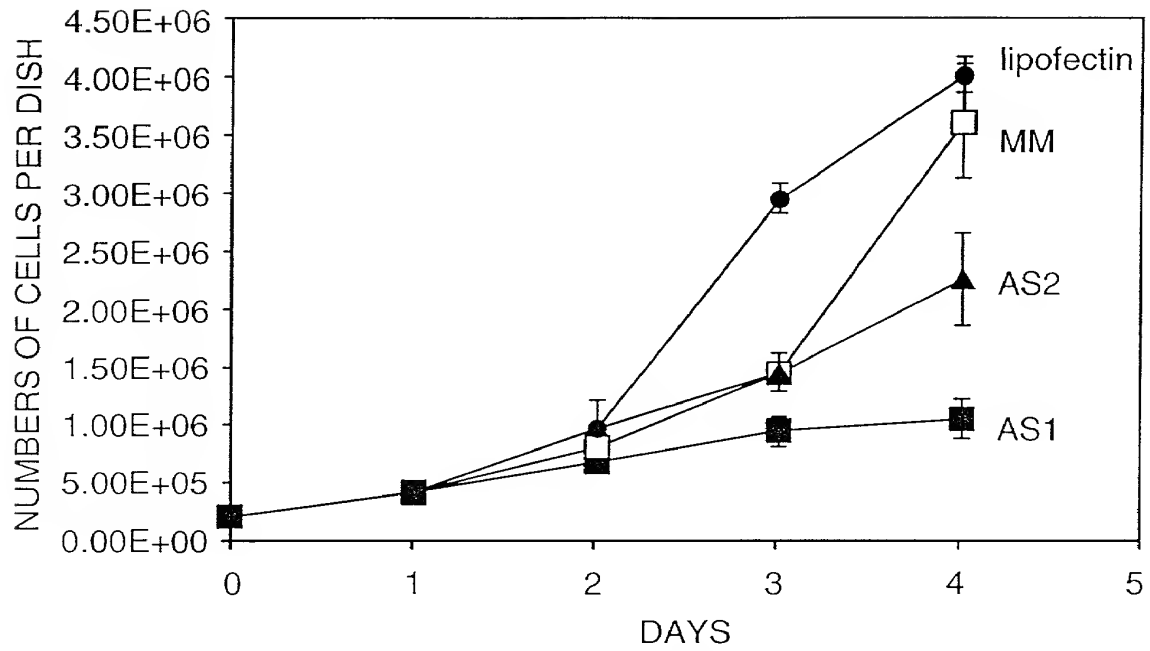


FIG. 12A

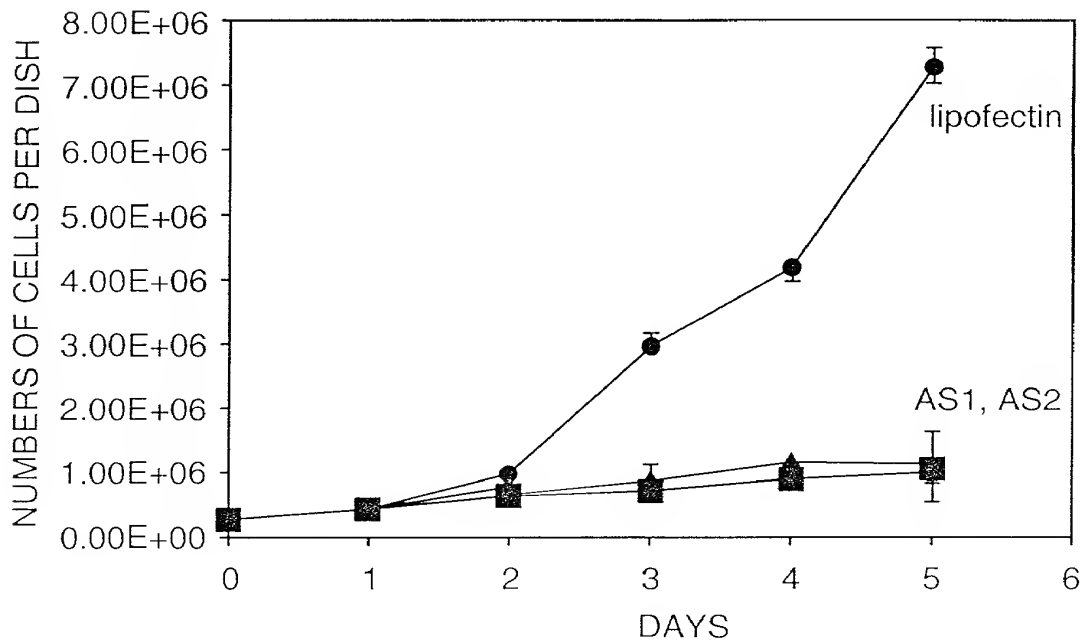


FIG. 12B



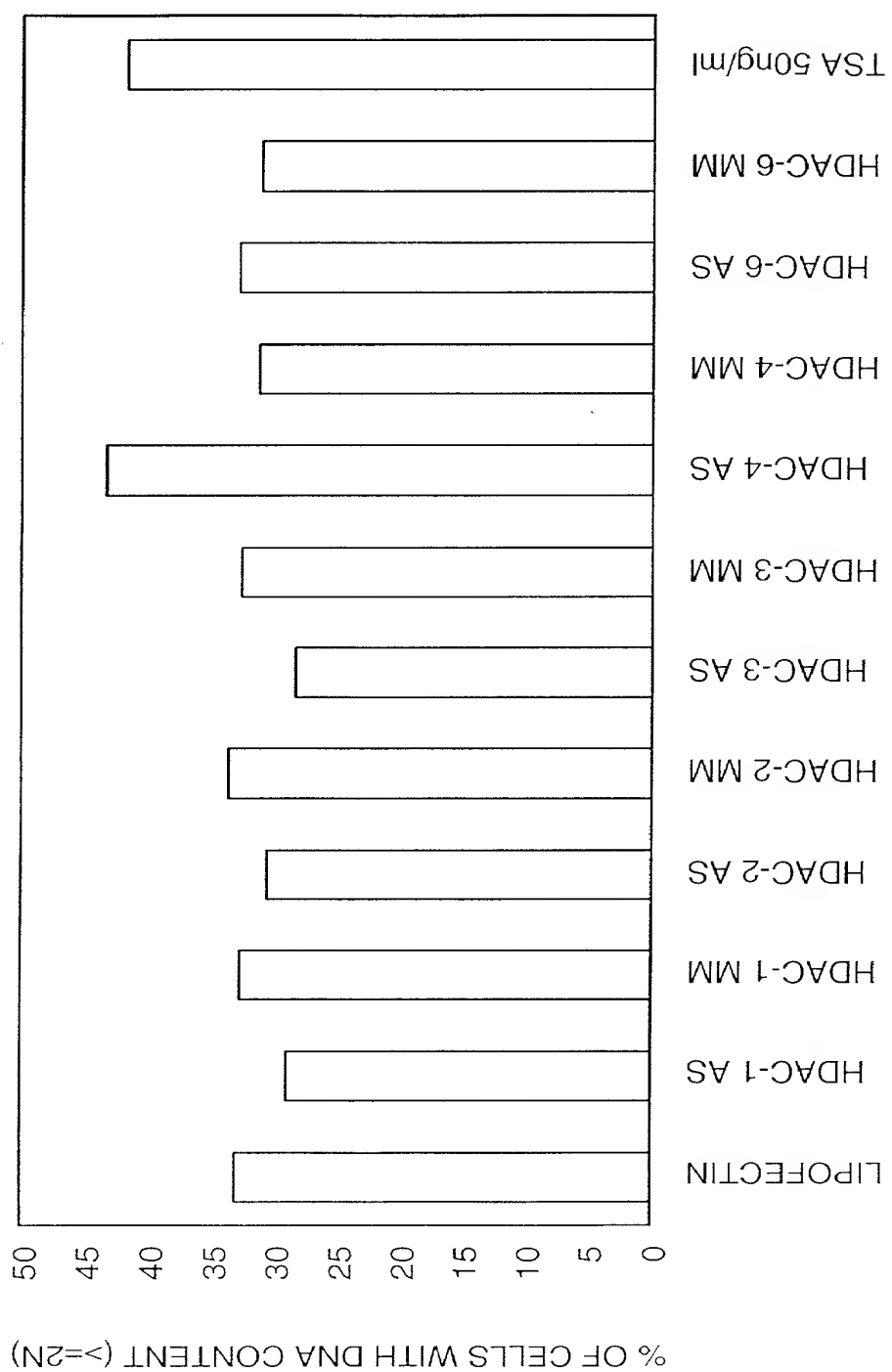


FIG. 13

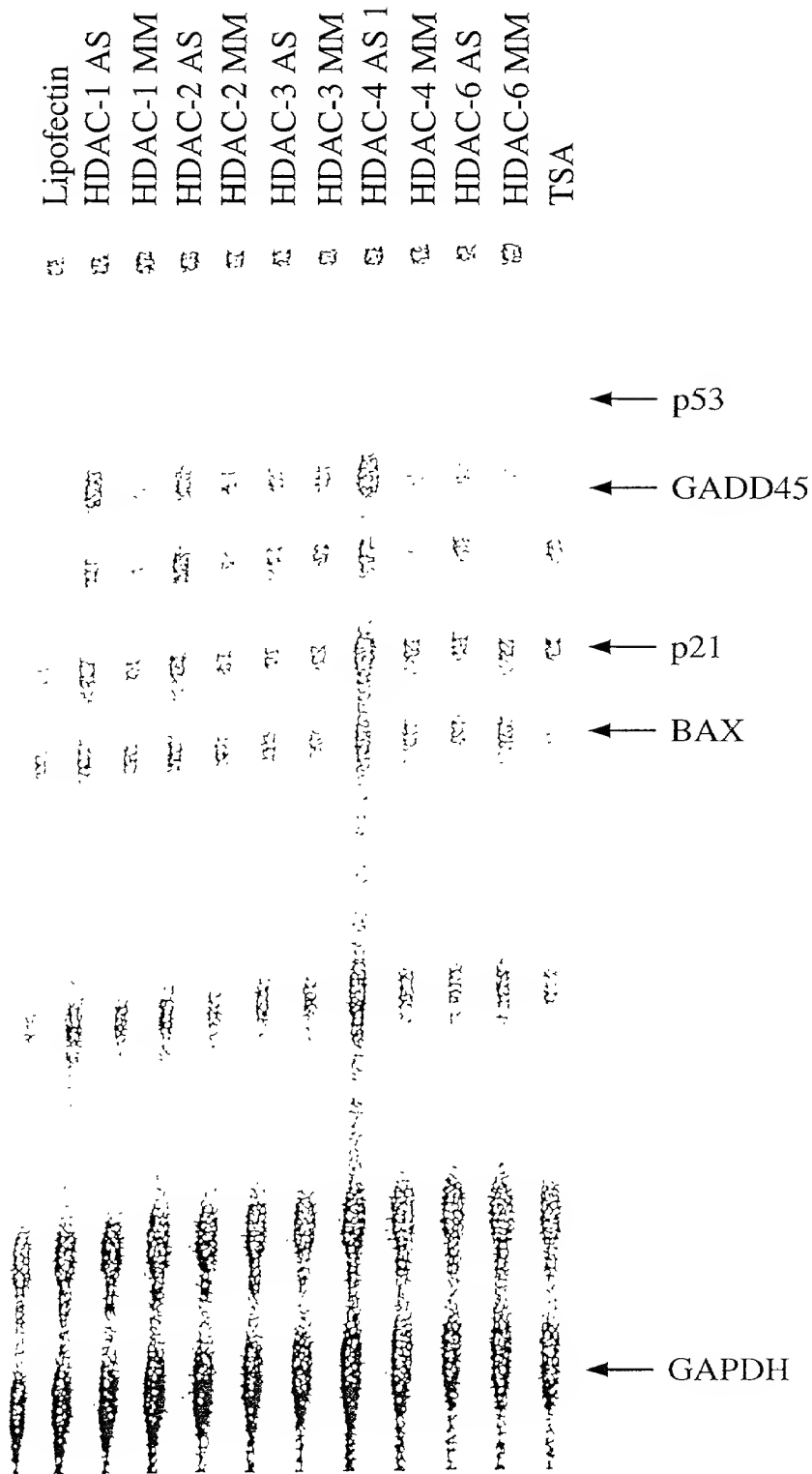


FIG. 14

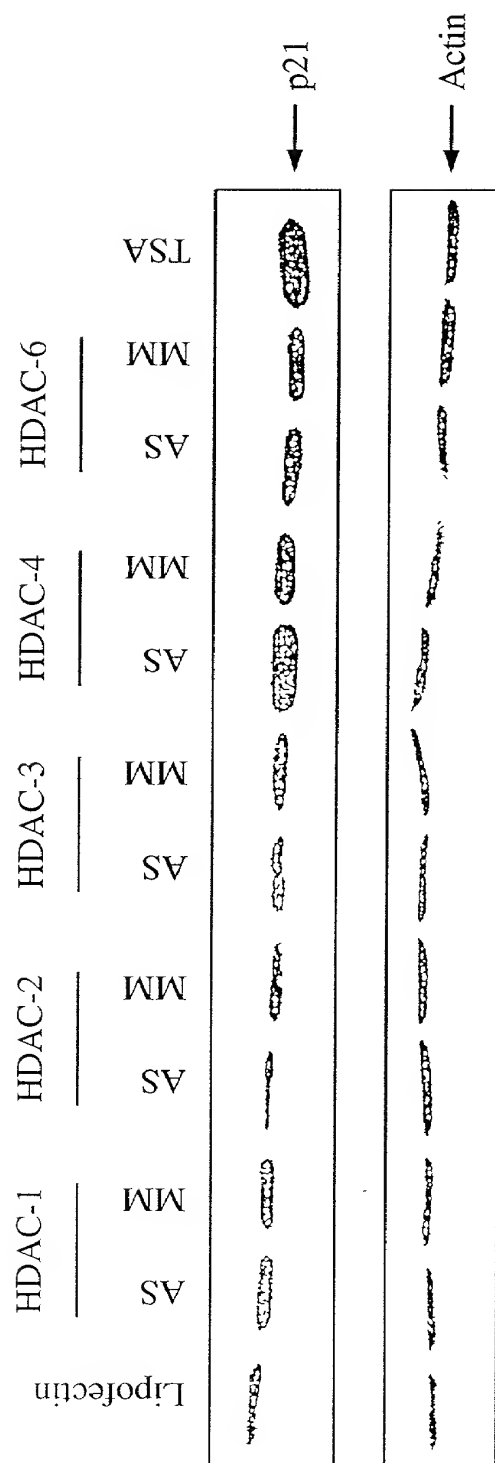


FIG. 15

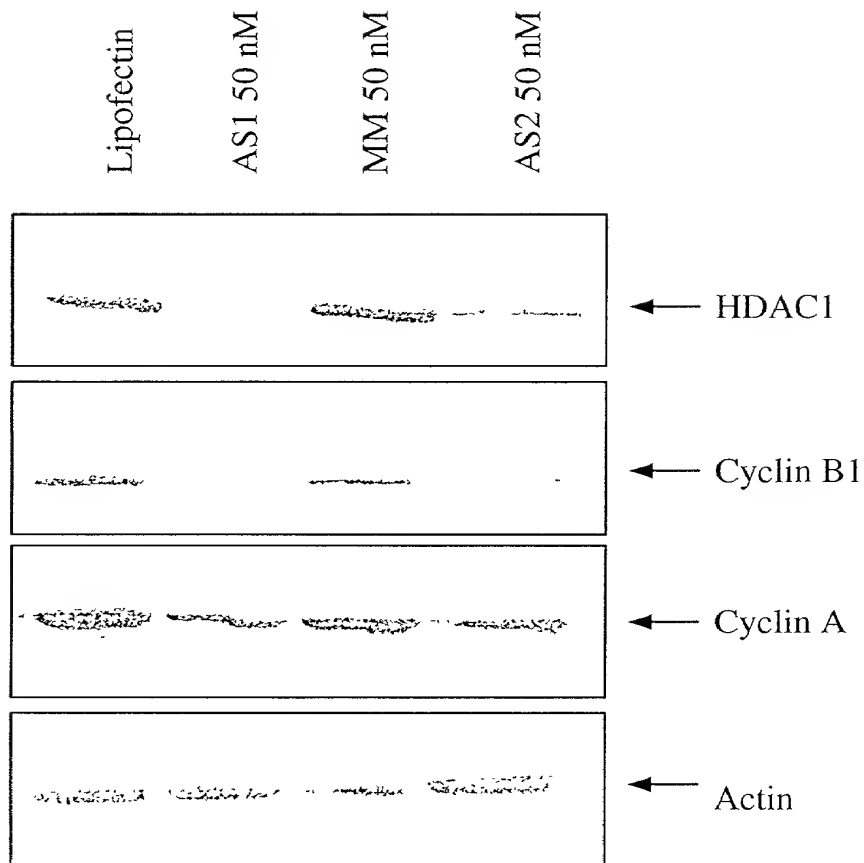


FIG. 16

